



Analysis Of Fabric Inventory Control In Koko Clothing Busines With Economic Order Quantity and Economic Production Quantity Methods

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ABSTRACT

Ramli collection is an industry that is engaged in garments in producing special men's peddles, especially in koko clothes who want a good and fitting basic material arrangement. The product that will be researched is koko clothes. One of the problems in Ramli collection is the purchase of raw materials that are not good and appropriate. Ramli Collection uses a system of purchasing raw materials 3 times in 1 month or after the fabric in the RamLi CoLlection warehouse runs out. With an average monthly purchase of 25 rolls of venus catton fabric and 20 rolls of ferarri catton fabric. As a result of this situation, the level of inventory in the warehouse will increase, increasing overall operating costs, from this problem it is felt to be less than optimal. This study determines the optimal amount using the EOQ and EPQ methods. The research was conducted from January 2021 to December 2021. This study uses the EOQ and EPQ methods. From the results of calculations with the EOQ method to get the optimal amount of raw materials for Catton Venus 184 roll and cattonferrari fabric 159 rolls. Calculation of the minimum inventory cost using the EOQ method on Catton Venus fabric Rp.55.877.600 and Catton Ferrari fabric Rp.42.445.640, calculation by EPQ method on Catton Venus fabric Rp.55.634.980 and Catton Ferrari Fabric Rp.42.220.070. The supply point (*Re-Order Point*) again occurs when the Catton Venus fabric is 20 rolls and the Catton Ferrari 16 roll fabric.



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1. Introduction

The manufacturing industry in the field of garments has very lightning progress and strives to be the best compared to its rivals. This matter is based on the continued high willingness of citizens to have quality clothing. As a result, many applications in supermarkets in the last few years have made a surge in applications (Nissa & Siregar, 2017). This study uses the Techniques of Economic Order Quantity (EOQ) and Economic Production Quantity (EPQ), which is one method of producing raw

materials that are widely used. This approach to raw materials discuss two issues: when to order and how much raw material should be produced and should be purchased. (Remasari et al., 2020)

Raw materials are a problem that is quite powerful in the field of production not only staffing, financial and so on. The company always wants a sufficient amount of supplies so that the course of production does not falter. Here does not mean that the basic cloth is in large quantities where the provisions in large quantities, have many effects such as vanishing, defects, paid for the treatment of money stuck and others, so that the amount of basic material supplies contained is not very small and not very large. (Candra, 2018).

Due to the shortage of raw materials, the increase in storage costs due to the difficulty of making basic materials, the slowness of shipping raw materials due to the slowness of ordering raw materials to suppliers, and annual period. To stay away from that situation the industry needs programming, management and arrangements on how to regulate its raw materials (Careza Rizky, Yuli Sudarso, 2016)

The system, there are items that play a certain role. Since these raw resources cannot be produced when needed, it is important to keep enough resources to use when needed. (Hazimah et al., 2020). To ensure that the planned action is carried out, inventory management has one action used. Research (Wahid and Munir, 2020) It is important to remember that overstock supplies can result in losses, while inadequate supply of raw materials can lead to profit suppression. (Cahyani dkk, 2019)

In the UMKM Ramli collection that makes koko clothes in Kebungson, Gresik District, Gresik Regency, East Java, this study was done. UMKM that specialize in the production of koko clothes. Ramli Collection there is a business established ie Mr. Ramli since 1975 with initial capitals, he with his wife and some workers provide the business. This industry works for 8-9 hours and passes a maximum of 2 hours in one day. This industry produces koko clothes with basic fabric materials, interlining and accessories. The fabric revenue, industry started from various suppliers. Therefore, the industry needs to be implemented to regulate basic raw materials in order to have maximum provisions.

The Ramli Collection uses a raw material purchase system 3 times in 1 month or after the fabric in the Ramli Collection warehouse runs out. With an average monthly purchase of 25 rolls of cotton venus fabric and 20 rolls of ferrari cotton fabric. Business activities are increasingly disrupted and product prices increase as a result of distributions that are in this lifetime. Therefore, a comparison of inventory production should be carried out using the Approach of Quantity of Economic Orders and Quantity of Economic Production.

The Economic Order Quantity (EOQ) method is often used because it is easy to implement and can share the best solution for the industry, this is evidenced by using the EOQ procedures not only known how many provisions are very useful for the industry, but also want to be known as the payment to be issued by the industry with the provision of basic materials that have been calculated with (Overall Inventory Cost) and a very suitable duration to carry out purchases. Return (calculated by Re-order Points) (Ritawiyati et al., 2018). The Economic Production Method (EPQ) is a procedure for setting up supplies to ensure the maximum production lability with maximum duration and the lowest overall cost of creation provisions. EPQ methods can help management, optimize basic material creation. (Ekawati et al., 2020)

Based on the results above, research was conducted on the management of raw material supplies of koko clothes in the Ramli Collection using the EOQ method and the EPQ method, from several types of fabrics, namely koko clothes cotton Venus, Cotton Ferrari fabric type. Looking at the data on the demand for koko clothes with Cotton Venus fabric materials, Cotton Ferrari is very high and often in production then according to the author will evaluate the supply of the fabric as raw materials.

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2. Literature Review

There are two types of supplies: finished commodities that are used for future use and raw materials used to produce finished goods. Good planning and management is needed to ensure that the company can meet the demands of the company and avoid non-existent supplies, which can result in wasted maintenance. Researchers Candra, (2018) A well-planned inventory delivery action is an action that considers the length, volume, quality, or cost of the inventory in question. (Pradana & Jakaria, 2020). There is a supply function as follows: (Cahyani et al., 2019)

- Decoupling function
A supply that frees a business from dependence on a single source to meet the needs of the company. Therefore, the organization does not have full control over the order or delivery time..
- Economic Lot Sizing Function
Transportation costs per unit are lowered as a result of low repair prices. Compared to the expansion that was realized as a result of significant expansion, the company.
- Anticipation Function
This function encourages companies to proactively conduct seasonal inventory based on historical data estimates of demand.

The inventory model uses cost as a parameter in making decisions, costs can generally be categorized in the product management system as follows: (Sa'idah et al., 2022)

- Purchase Cost, This is the cost incurred when the company purchases a large number of products necessary for production.
- Procurement Cost,
 - a) The cost of ordering includes the cost of bringing goods from outside the company. Shipping, phone inspection, and delivery to the warehouse all include at this price.
 - b) Production costs are all costs incurred in the production that produces the product.
- The cost of storing the product is referred to as the cost of storage. Electricity, factory taxes, administration, operations, damage and depreciation, insurance, and storage all include this cost.

a. *Economic Order Quantity (EOQ)*

The EOQ method which stands for Economic Order Quantity is an inventory manufacturing strategy that uses effective inventory deposition procedures to reduce the cost of shipping and storing goods. (Hidayat et al., 2020). To find out how many very low-cost shipments are available for a single record, use the EOQ approach. (Hudzaifah & Marbun, 2015) The application of this method is based on some assumptions as follows: (Sa'idah et al., 2022)

1. Calculation occurs in 1 type of product
2. The level of demand is constant and known
3. There is no shortage of goods
4. Lead time is constant and known
5. The price of goods per unit is constant and there is no discount
6. Storage costs per unit are constant
7. The cost of ordering in one-time ordering raw materials is constant

b. *Economic Production Quantity (EPQ)*

EPQ methods or maximum production levels are some of the special productions obtained by minimizing the entire supply fee consisting of creation set-up pay and storage fees. (Tipaka et al., 2017). There is also an assumption that what is used is: (Fibriani et al., 2018)

1. Rest the duration of discrete demand delivery remains.

2. The pay part does not change throughout the production time span.
3. The price of the product is always and there is no editing corting.
4. Machine breakdown is not implemented As long as the creation activity is being carried out.
5. There is no backorder and rework situation.
6. Machine degeneration and unsustainability during production activities.
7. The capacity of creation and delivery is fixed.
8. No imperfect product or defective product is recommended.
9. There is no safety stock.
10. Throughout the duration of creation, there is no activity of consuming products.Demand in that cycle is crowded sourced from the production of the previous cycle.
- 11.The product made is a single product item.

c. Data Collection and *Conception* of Variable Collection

The variables used in this study are: (Tipaka et al., 2017)

- 1) Volume of fabric requirements (Roll)
- 2) Fabric distribution volume (Roll)
- 3) The cost of ordering cloth (Idr / Roll) there are costs that are circulated related to the storage of fabrics, including:
 - a. Phone fee
 - b. Transportation costs
 - c. Power/driver cost
- 4) Storage costs (Idr / Roll), there are costs that are distributed for fabric storage, including:
 - a. Warehouse costs
 - b. Electrical Cost
 - c. Employee salary

3. Methodology

This research is using quantitative and qualitative data. Quantitative data form of nominal figures from the company under study. The data obtained data on the amount of raw material needs in 2021, order cost data for 2021, and raw material storage data for 2021. Qualitative data is data that is described descriptively or several explanations about the company's picture like information about the history of the founding of Ramli Collection and the organizational structure of the company owned by Ramli Collection.

Types of data by Source is primary data and secondary data. Primary data is data that was first observed and recorded by researchers at the Ramli Collection. In this study, which includes primary data is the cost of storing raw materials, the cost of ordering raw materials each time an order and daily production capacity. Secondary data is a data source that does not directly provide data to data collectors. This secondary data is data that supports the needs of secondary data such as books, literature, articles and various other sources related to research.

Method of collecting data this study uses several methods to collect data. The methods used observation, Interview, and Documentation. Observation is a data collection technique by conducting direct observations on the object under study so that a clear picture of the formulation of the problem is obtained. Observational research was carried out directly by visiting the Ramli Collection. Interviews are a number of questions that will be asked to respondents orally. Interviews must be conducted in depth in order to obtain valid and

detailed data. Documentation a data collection technique in which researchers investigate written objects such as books, magazines, documents, and so on. In this study, documentation was obtained from the Ramli Collection regarding the required information.

a. Calculation By Economic Order Quantity Method (EOQ)

In applying this research method the formula used in solving problems with the EOQ method, here is the EOQ formula:

1. Optimal booking calculation (EOQ)

$$EOQ = \sqrt{\frac{2X(D \times S)}{H}} \tag{1}$$

2. Calculation of safety stock

$$Safety\ Stock = Z \times \alpha \tag{2}$$

3. Calculation of the frequency of loading raw materials (EOQ)

$$F = \frac{D}{EOQ} \tag{3}$$

4. Re-Order Point Calculation (EOQ)

$$ROP = D \times L \tag{4}$$

5. Inventory Maximum Calculation (EOQ)

$$IMax = SS + EOQ \tag{5}$$

6. Calculation of total inventory costs (EOQ)

$$TC = \left(\frac{D}{EOQ}\right) \times S + \left(\frac{EOQ}{2}\right) \times H \tag{6}$$

Notation dalam provisioning EOQ method:

- D = the large number of requests for goods for a year
- S = The booking fee for each booking is submitted
- H = Cost of deposit per-unit/year
- SS = *Safety Stock*
- L = Time needed for re-production
- Z = Safety factor
- A = Standard deviation of orders during leisure time

b. Calculation of Economic Production Quantity Method (EPQ)

The formula used adjusts the problem with the EPQ method, as follows:

1. Optimal production rate calculation formula (EPQ)

$$EPQ = \sqrt{\frac{2 \times D \times S}{H \times \left(1 - \frac{d}{p}\right)}} \tag{7}$$

2. Optimal time interval calculation formula (EPQ)

$$F = \frac{EPQ}{p} \tag{8}$$

3. Re-Order Point calculation formula (EPQ)

$$ROP = dx \frac{Q}{p} \tag{9}$$

4. Inventory Maximum calculation formula (EPQ)

$$I_{max} = EPQx \left(1 - \frac{d}{p}\right) \quad (10)$$

5. Inventory cost calculation formula (EPQ)

$$TC = (dx p) + EPQ x H \left(\frac{p-d}{p}\right) \quad (11)$$

Notation used in The EPQ method:

- D = number of requests for goods for 1 year
- S = One-time booking fee
- H = Cost of deposit per-unit/year
- p = amount of production for 1 year (day)
- d = Speeding rate per unit of time (day)

This research is carried out with several stages that researchers have done in solving problems in the Ramli Collection.

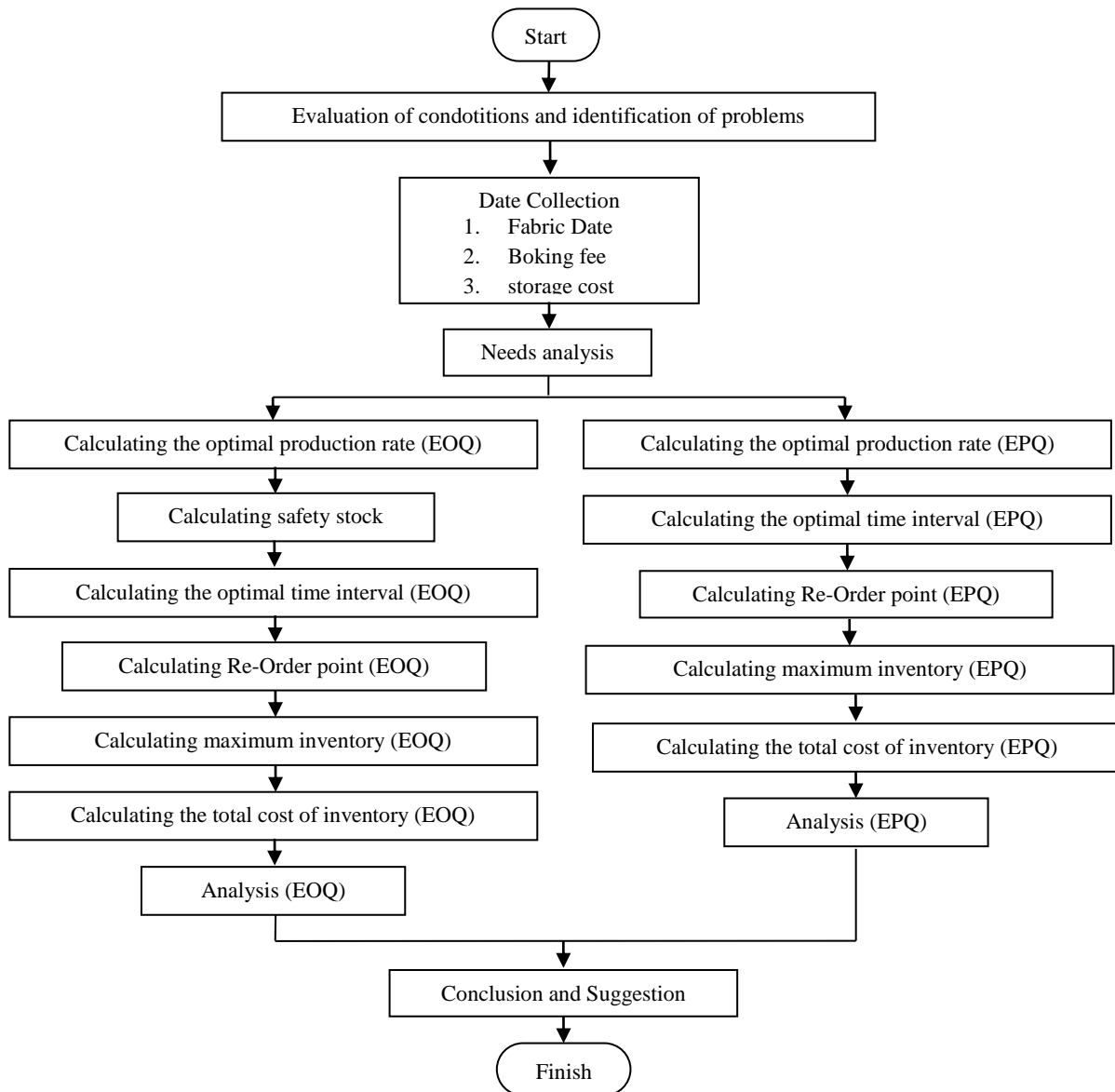


Figure 1. Flow Chart

4. Results and Discussion

In addition to Catton Venus and Catton Ferrari koko textiles, Ramli Collection also makes koko T-shirts with other materials. Ramli Collection will utilize this fabric as a benchmark for inventory management. The following is the data on the type of fabric used for the manufacture of koko clothes:

Table 1. Venus Catton Fabric Data

No.	Year	Month	Purchase (Roll)	Inventory (Roll)	Demand (Roll)	Remainder (Roll)
1	2020	December	-	-	-	15
2	2021	January	25	40	25	15
3		February	20	35	20	15
4		March	20	35	28	7
5		April	25	32	23	9
6		May	26	35	25	10
7		June	23	33	28	5
8		July	30	35	20	15
9		August	20	35	28	7
10		September	38	45	32	13
11		October	26	39	30	9
12		November	25	34	27	7
13		December	30	37	25	12
	Total		308	435	311	139
	Average/Month		25,67	36,25	25,92	10,69

Source : Ramli Collection

The stock of Catton Venus fabric is 435 roll, with a demand (demand) of 311 roll catton venus fabric, as seen in table 1. Catton Venus type koko T-shirt data from January 2021 to December 2021 can be found in the data on the repair, inventory, demand and remaining fabric. Because the initial stock amount is greater than friday Demand, it is related to the increase in the cost of storing fabrics. Below is a histogram of table 1.

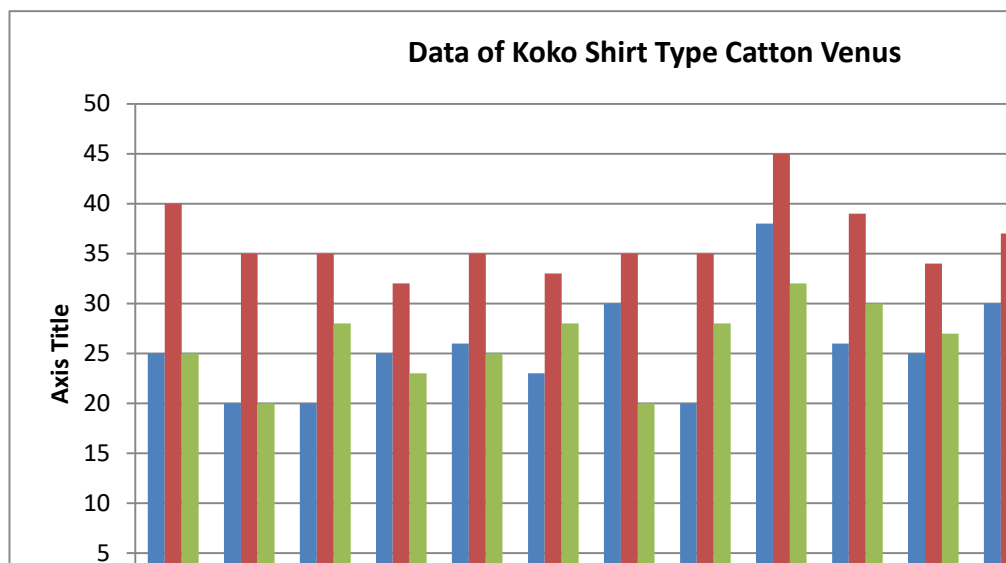


Figure 2. Catton Venus Type Koko Cloth Data Histogram

From figure 2 we can conclude that the most purchases and sales of Catton Venus fabrics are in September 2021.

Table 2. Catton Ferrari Fabric Data

No.	Year	Month	Purchase (Roll)	Inventory (Roll)	Demand (Roll)	Remainder (Roll)
1	2020	December	-	-	-	12
2	2021	January	15	27	22	5
3		February	18	23	19	4
4		March	20	24	17	7
5		April	15	22	16	6
6		May	20	26	20	6
7		Juny	20	26	18	8
8		July	25	33	20	13
9		August	20	33	28	5
10		September	25	30	25	5
11		October	20	25	20	5
12		November	25	30	23	7
			December	20	27	19
		Total	243	326	247	91
		Average/Month	20,25	27,17	20,58	7,00

Source : Ramli Collection

Table 2 shows statistics for Catton Ferrari fabric types, including inventory data, welding data, Demand data, and the rest of each crib from January 2021 to December 2021. Table 2 shows that from January 2021 to December 2021, supply (326 rolls) will be more than demand (sales) (247 rolls), resulting in storage costs. Table 2 has the following histogram.

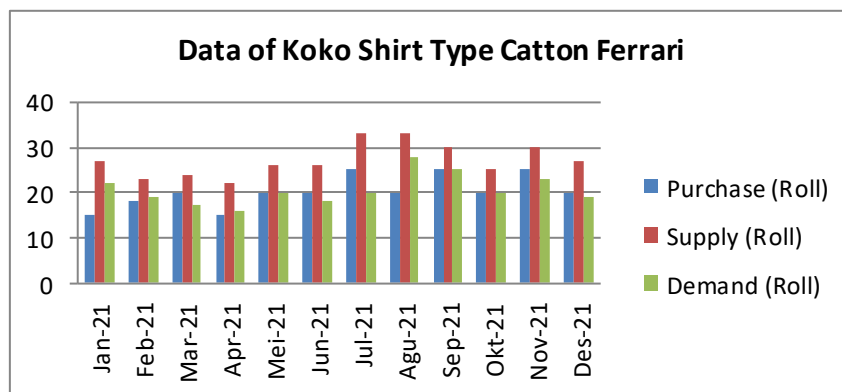


Figure 3. Catton Ferrari Type Koko Shirt Fabric Data Histogram

From figure 2 histogram data of Catton Ferrari type fabrics can be concluded the purchase of the most Catton Ferrari type fabrics in July, September and November 2021.

a. Booking fee

Here is a breakdown of the costs that Ramli Collection charges for each order. here are the results of the interview with Ramli Collection musician in table 3.

Table 3. Fabric order fee Period January 2021-December 2021

No.	types of costs	IDR/Year
1	Phone fees	Rp. 840.000
2	Fuel (gasoline)	Rp. 2.400.000
3	Driver's salary	Rp. 16.800.000
	Total	Rp. 20.040.000

Source : Ramli Collection

From table 3, you can find out the cost of rp. 70,000 / month, the cost of fuel (gasoline) Rp. 200,000 / month, and the driver's salary Rp.1,400,000 / month. So the total cost of booking in 1 year is Rp.20,040,000 or Rp.1,670,000/month.

b. Storage Cost

Storage costs (transportation costs or ownership costs) are related costs If there are supplies, such as electricity costs, employee salary costs, inspection costs, cleaning costs whose costs are divided by the amount of raw materials produced. The cost of storing Ramli Collection is as follows:

Table 4. Fabric storage cost Period January 2021- December 2021

No.	Types of cost	IDR/Year
1	Electricity	Rp.1.800.000
2	Warehouse Tax	Rp. 4.980.000
3	Employee Salary	Rp. 12.000.000
	Total	Rp.18.780.000

Source : Ramli Collection

Electricity cost Rp. 150,000/month; warehouse tax of Idr. 415,000/month; and staff salary is a total of Rp. 1,000,000/month, according to table 4. So the total storage cost for the period January 2021-December 2021 is Rp. 18,780,000 /year or Rp. 32,491 per roll. The allocation of storage costs in harmony with the demand for Venus and Ferrari type textiles resulted in a fabric storage cost of 578 rolls per month in the period January 2021-December 2021. Catton Venus has 311 rolls and Catton Verrari has 247 rolls of fabric.

c. Total Cost of Inventory

The cost is the total cost of the booking fee, the cost of storage in the Ramli Collection, as follows:

Table 5. koko shirt production inventory cost period January 2021- December 2021

No.	Booking Cost	Storage Cost	Total cost of inventory
1	Rp. 20.040.000	Rp.18.780.000	38.820.000

Table 5 shows that the annual distribution of Ramli Collection inventory results in the largest distribution, namely the cost of textual ordering of Rp 20,040,000, the storage cost of Rp 18,780,000, and the cost of inventory for the period January 2021-December 2021 of Rp 38,820,000.

The information collected indicates that the alasan to query the Textual Ramli Collection is based only on current estimates. Reservations will be made if the available fabrics go down. When the demand for raw materials is not in line with output, there is a tendency to accumulate stock in warehouses, encouraging an increase in production costs in general. However, if the company's inventory is low, it can lead to a period of manufacturing and result in an inability to meet the demand for manufacturing.

d. Calculation of inventory analysis by EOQ method

The assumptions of the EOQ method are fulfilled, so that ramli collection can carry out calculations. The company can calculate the cost-effective and consistent orders of textiles and koko T-shirt manufacturing by using this solution. For Catton Venus and Catton Ferrari fashions, fabric control (raw materials of koko clothing) is calculated using the POM aplikasi below:

QM for Windows - [Data] Results			
Kain Jenis Catton Venus Solution			
Parameter	Value	Parameter	Value
Demand rate(D)	331	Optimal order quantity (Q*)	184.46
Setup/ordering cost(S)	1670000	Maximum Inventory Level (Imax)	184.46
Holding/carrying cost(H)	32491	Average inventory	92.23
Unit cost	150000	Orders per period (N)	1.79
Days per year (D/d)	360	Annual Setup cost	2996669
Daily demand rate	.92	Annual Holding cost	2996669.0
Lead time (in days)	14	Total Inventory (Holding + Setup) Cost	234260.1
Safety stock	7.21	Unit costs (PD)	49650000
		Total Cost (including units)	55877600
		Reorder point	20.08 units

Figure 4. Economic Order Quantity Fabric type Catton Venus

Figure 4 shows the optimal order quantity of catton venus type fabric of 184.46 rolls or rounded to 184 rolls, the maximum supply level of 184.46 rolls rounded to 184 rolls, with an average of 92.23 rolls or rounded 92 rolls, orders per-period / per year by 2 times. Annual order fee of Rp. 2,996,669, annual storage fee of 2,996,669, annual safety stock storage cost of Rp. 234,260, and unit cost of Rp.49,650,000

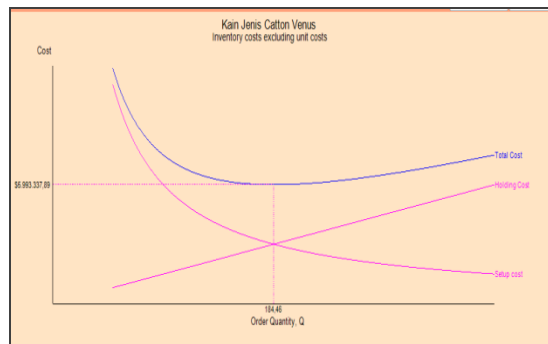


Figure 5. Venus Catton Fabric Supply Curve with EOQ method

Figure 5 is the result of the Catton Venus fabric supply curve where the optimal point of supply of Catton Venus fabric is obtained if a minimum cost of Rp. 5,993,337 is issued, with a fabric supply level of 184.46 roll or 184 roll.

Kain Jenis Catton Ferrari Solution			
Parameter	Value	Parameter	Value
Demand rate(D)	247	Optimal order quantity (Q*)	159.35
Setup/ordering cost(S)	1670000	Maximum Inventory Level (Imax)	159.35
Holding/carrying cost(H)	32491	Average inventory	79.67
Unit cost	150000	Orders per period (N)	1.55
Days per year (D/d)	360	Annual Setup cost	2588649.0
Daily demand rate	.69	Annual Holding cost	2588650.0
Lead time (in days)	14	Total Inventory (Holding + Setup) Cost	218339.5
Safety stock	6.72	Unit costs (PD)	37050000
		Total Cost (including units)	42445640
		Reorder point	16.33 units

Figure 6. Economic Order Quantity Fabric type Catton Ferrari

For the Catton Ferrari type 159.35 roll or 159 roll, the maximum inventory level with an average of 79.67 or rounded to 79 roll per year there is an ideal order rate, shown in Figure 6 (rounded to 159 roll). The annual order fee is Rp 2,588,649, the annual storage fee is Rp 2,588,650, the annual safety stock storage price is Rp 218,339, and the unit fee is Rp 37,050,000.

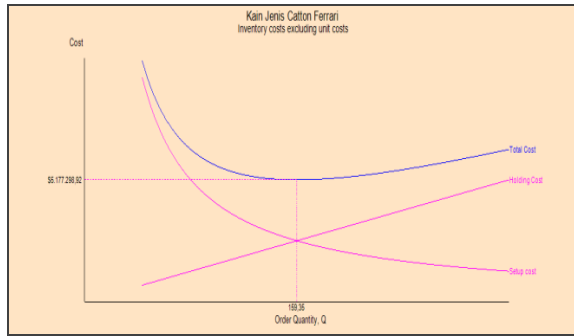


Figure 7. EOQ Inventory curve Catton Ferrari Fabric

Figure 5 is the result of the Catton Venus fabric supply curve where the optimal point of supply of Catton venus type fabric is obtained if there is a minimum cost of Rp. 5,177,298, with a fabric supply level of 159.35 rolls or rounded up as much as 159 roll.

From the results of the calculation of catton venus and catton ferrari type fabric using the EOQ method then recapitulated the calculation to draw conclusions, as follows:

Table 6. Recapitulation of EOQ calculations in ramli collection

No.	Information	Venus catton fabric	Ferrari catton fabric
1	EOQ	184 Roll	159 Roll
2	Safety Stock	7 Roll	6 Roll
3	Frequency of fabric purchase	2 times/year	2 times/year
4	Re-Order Point	20 Roll	16 Roll
5	Inventory Maximum	184 Roll	159Roll
6	Total Cost of inventory	Rp.55.877.600	Rp. 42.445.640

e. Calculation by EPQ method

Calculation of Catton Venus and Catton Ferrari type fabrics with the EPQ method, here is the calculation of the EPQ method using pom aplikasi:

Parameter	Value	Parameter	Value
Demand rate(D)	331	Optimal production quantity (Q*)	184,72
Setup/ordering cost(S)	1670000	Maximum Inventory Level (Imax)	184,2
Holding/carrying cost(H)	32491	Average inventory	92,1
Daily production rate(p)	330	Production runs per period (year)	1,79
Days per year (D/d)	360	Annual Setup cost	2992492,0
Daily demand rate	,92	Annual Holding cost	2992491,0
Unit cost	150000	Total Inventory (Holding + Setup) Cost	5984983
		Unit costs (PD)	49650000
		Total Cost (including units)	55634980

Figure 8. Economic Production Quantity Catton Venus Fabric

Using the POM calculation in Figure 8, optimal production is 184.2 or 184 roll, the production rate is 1.79 or 2 times per year, and the company provides a maximum supply of 184.2 or 184 roll with an average of 92 roll. The cost to carry supplies is Idr 55,634,980, the annual ordering fee is Rp. 2,992,492, and the annual storage fee is Rp. 2,992,492; the company provides a maximum supply of 184.2 or 184 rolls, with an average of 92 rolls.

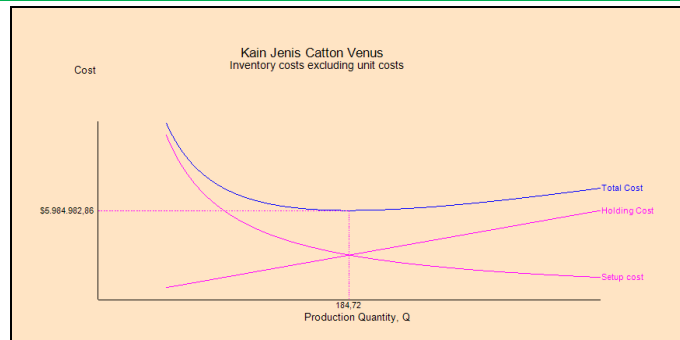


Figure 9. Catton Venus fabric supply curve with EPQ method

The results of the 9-point optimal figure of Catton Venus type fabric are obtained if the minimum cost is disbursed at Rp. 5,984,982 with a fabric supply level of 184.72 roll or reduced to 185 roll.

QM for Windows - [Data] Results			
Kain Jenis Catton Ferrari Solution			
Parameter	Value	Parameter	Value
Demand rate(D)	247	Optimal production quantity (Q*)	159,57
Setup/ordering cost(S)	1670000	Maximum Inventory Level (Imax)	159,12
Holding/carrying cost(H)	32491	Average inventory	79,56
Daily production rate(p)	246	Production runs per period (year)	1,55
Days per year (D/d)	360	Annual Setup cost	2585037
Daily demand rate	,69	Annual Holding cost	2585037
Unit cost	150000	Total Inventory (Holding + Setup) Cost	5170074
		Unit costs (PD)	37050000
		Total Cost (including units)	42220070

Figure 10. Economic Production Quantity Fabric Catton Ferrari

Based on the calculations shown in Figure 10, the optimal production frequency is 159.57 rolls, which is rounded to 159 rolls, and the production frequency that must be done there are 1.55 or 2 times in 1 year to avoid risks arising, the company provides a maximum supply of 159.12 or 159 rolls with an average of 79.56 or 80 rolls, and the cost to do the inventory is Rp. 42,220,070, the annual booking fee is Rp. 2,585,037.

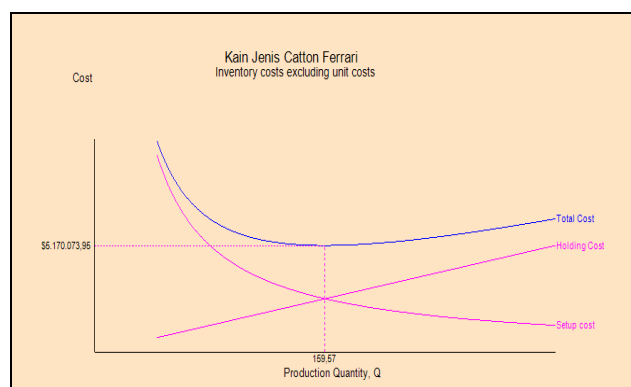


Figure 11. Catton Ferrari fabric supply curve with EPQ method

If the cost is at least Rp 5,170,073 with a fabric supply level of 159.57 rolls or rounded to 159 rolls, then the result of the ideal 9-point drawing for Catton Ferrari type fabric can be achieved. Catton Venus and Catton Ferrari's fashion inventory was then calculated using the EPQ technique, and the results were summarized to arrive at the following findings:

Table 7. Recapitulation of EPQ calculations in ramli collection

No.	Information	Venus catton fabric	Ferrari catton fabric
1	EPQ	185 roll	159 roll
2	Frequency of fabric purchase	2times/year	2 times/year
3	<i>Inventory Maximum</i>	185 roll	159 roll
4	Total Cost of inventory	Rp. 55.634.980	Rp. 42.220.070

f. Comparison of Fabric Inventory Control EOQ Method and EPQ Method

The Tabel 8 shows the overall cost of the Catton Venus and Catton Ferrari per mile compared to the previous model. It can be seen from the tabel above that the EPQ method can be used in the Ramli Collection catalog system. However, it is possible that the EOQ method cannot be used because the total cost of the method is not much different, but the analysis of the two methods above gets an evaluation in terms of demand, mode, and profit that can be used as a basis for evaluation and evaluation of ramli collection inventory system policy.

Table 8. Comparison of Total Cost of Catton Venus and Catton Ferrari Fabric Supplies Between EOQ and EPQ methods

No.	Fabric Description	EOQ Method	EPQ Method
1	Catton Venus	Rp. 55.877,600	Rp. 55.634.980
2	Catton Ferrari	Rp. 42. 445.640	Rp. 42.220.070

5. Conclusion

From the results of the initial research conducted by the author, it was found that the use of the control control system was still simple and would not be fine. Under these conditions, there is often an increase in raw materials in warehouses because the need for raw materials is not adjusted to production needs so that the increase in expenditure costs also increases. The purpose of this study is to determine the number of orders that are economical using the EOQ method and the optimal production amount using the EPQ method and determine the amount of minimum inventory based on these two methods.

Before calculating the amount using the EOQ method, the purchase of Ramli Collection fabric for Catton Venus 380 fabric and Catton Ferrari 243 roll roll in the period January 2021-December 2021. And after using the EOQ method, we get the optimal amount of raw material for koko shirt type Catton Venus 184 roll and for 159 rolls of Catton Verrari fabric and calculations using the EPQ method of Catton Venus 185 rolls and Catton Ferrari 159 fabrics. Calculation of minimum inventory cost using EOQ method on Catton Venus Rp. 55,877,600 and Catton Ferrari Rp. 42.445.640, the calculation using the EPQ method on the Catton Venus Rp. 55,634,980 and Catton Ferrari Rp. 42,220,070. The supply point again occurs when there are 20 rolls of Catton Venus fabric and 16 rolls of Catton Ferrari fabric. Based on the calculation of EOQ and EPQ when compared to the EPQ method, it can minimize costs with the difference in the Catton Venus fabric of Rp. 242,620 and Catton Ferrari Rp. 225.570

References

- Cahyani, Pulawan, & Santini. (2019). Analisis Persediaan Bahan Baku Untuk Efektivitas dan Efisiensi Biaya Persediaan Bahan Baku Terhadap Kelancaran Proses Produksi pada Usaha Industri Tempe Murnisingaraja di Kabupaten Badung How to cite (in APA style). *Bisnis Dan Akuntansi*, 18(2), 116–125. https://ejournal.warmadewa.ac.id/index.php/wacana_ekonomihttp://dx.doi.org/10.22225/we.18.2.1165.116-125

- Candra, A. (2018). Pengendalian Persediaan Material Pada Produksi Hot Mix Dengan Pendekatan Metode Economic Order Quantity (EOQ). *Jitmi, 1*, 145–153.
- Careza Rizky, Yuli Sudarso, S. E. S. (2016). Analisis Perbandingan Metode EOQ dan Metode POQ Dengan Metode Min-Max Dalam Pengendalian Persediaan Bahan Baku Pada PT Sidomuncul Pupuk Nusantara. *Admisi Dan Bisnis, 17 No 1*(ISSN 1411 – 4321), 11–22.
- Ekawati, H., Adytia, P., & Yunita, Y. (2020). Penerapan Metode EPQ(Economic Production Quantity) Pada Pengendalian Bahan Baku Laundry Di Samarinda Laundry Mart Barbasis Android. *Jurnal Ilmiah Matrik, 22*(1), 64–72. <https://doi.org/10.33557/jurnalatrik.v22i1.840>
- Fauzi, A., Mas'ud, M. I. (2019). Proses Manufaktur pada Mesin Primer dan Sekunder CV. Karunia Menggunakan Metode Linier Programming. *Journal Knowledge Industrial Engineering(JKIE), 6*(2), 59–65.<https://doi.org/10.35891/jkie.v6i2.2055>
- Fibriani, E., Cahyadi, D., & Farid H, A. (2018). Model Economic Production Quantity (EPQ) dengan Sinkronisasi Demand Kontinu Dan Demand Diskrit pada Produksi Kerupuk Ikan Sungai Khas Kalimantan Timur. *JST (Jurnal Sains Terapan), 4*(1), 1–9. <https://doi.org/10.32487/jst.v4i1.444>
- Hazimah, H., Sukanto, Y. A., & Triwuri, N. A. (2020). Analisis Persediaan Bahan Baku, Reorder Point dan Safety Stock Bahan Baku ADC-12. *Jurnal Ilmiah Universitas Batanghari Jambi, 20*(2), 675. <https://doi.org/10.33087/jiubj.v20i2.989>
- Hidayat, K., Efendi, J., & Faridz, R. (2020). Analisis Pengendalian Persediaan Bahan Baku Kerupuk Mentah Potato Dan Kentang Keriting Menggunakan Metode Economic Order Quantity (EOQ). *Performa: Media Ilmiah Teknik Industri, 18*(2), 125–134. <https://doi.org/10.20961/performa.18.2.35418>
- Hudzaifah, & Marbun, D. P. (2015). *Analisis Optimalisasi Persediaan Dengan Menggunakan Metode Economic Order Quantity (EOQ)*. 2, 37–48.
- Junaedi, D., Mas'ud, M. I. (2018). Penerapan Metode Forecasting dalam Perencanaan Produksi Bakpia dengan Menggunakan Software POM Guna Memenuhi Permintaan Konsumen. *Journal Knowledge Industrial Engineering (JKIE), 5*(3), 121–128. <https://doi.org/10.35891/jkie.v5i3.2042>
- Nissa, K., & Siregar, M. T. (2017). Analisis Pengendalian Persediaan Bahan Baku Kain Kemeja Poloshirt Menggunakan Metode Economic Order Quantity (Eoq) Di Pt Bina Busana Internusa. *International Journal of Social Science and Business, 1*(4), 271. <https://doi.org/10.23887/ijssb.v1i4.12169>
- Pradana, V. A., & Jakaria, R. B. (2020). Pengendalian Persediaan Bahan Baku Gula Menggunakan Metode EOQ Dan Just In Time. *Bina Teknika, 16*(1), 43. <https://doi.org/10.54378/bt.v16i1.1816>
- Remasari, A., Suseno, Y. D., & Sunarso. (2020). *Analisis Pengendalian Persediaan Bahan Baku dengan Metode Economic Order Quantity dan Economic Production Quantity Pada Brownies Cinta Di Karanganyar Astri*. 20(April), 40–53.
- Ritawiyati, Maryanti, S., & Thamrin, M. (2018). Metode Economic Order Quantity (Eoq) Sebagai Dasar Pengendalian Bahan Baku Tepung Terigu. *Jurnal Ilmu Komputer Dan Bisnis, 9*(2), 2059–2069. <https://doi.org/10.47927/jikb.v9i2.136>
- Sa'idah, N., Fathoni, M. Z., & Hidayat. (2022). *Analisis pengendalian persediaan bahan baku tas di ud wijaya dengan metode eoq dan epq*. January 2021.
- Tipaka, Y., Paendong, M., & Mongi, C. (2017). Analisis Pengendalian Persediaan Bahan Baku Bunga Krans Pada Usaha Bunga Plastik Dengan Menggunakan Metode Economic Order Quantity Dan Metode Economic Production Quantity. *Jurnal Ilmiah Sains, 17*(2), 89. <https://doi.org/10.35799/jis.17.2.2017.16651>
- Wahid, A., & Munir, M. (2020). Economic Order Quantity Istimewa pada Industri Krupuk “ Istimewa ” Bangil. *Industrial View, 02*(01), 1–8.
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